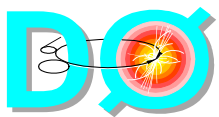


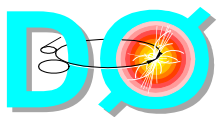
Week of July 16 to July 22 DØ Summary

- Delivered luminosity and operating efficiency
 - ◆ Delivered: 1.6pb^{-1}
 - ◆ Recorded: 1.0pb^{-1} (~65%)
- Major reasons for in-efficiency
 - ◆ Loss of ~6 hours due to Level 1 calorimeter trigger problem during Sunday owl shift
 - ◆ Muon readout stability
 - ◆ CFT/SMT downloading issues
- Stable running at twice higher Level 1 and Level 2 accept rates
 - ◆ ~0.2kHz out of Level 1 trigger
 - ◆ ~140Hz out of Level 2 trigger
 - ◆ ~50Hz to tape
- Last week operational issues
 - ◆ Loss of LVPS in the muon system
 - ▲ replaced on Sunday access
 - ◆ Commissioning of fiber tracker trigger
- Halo rates are back to stable values



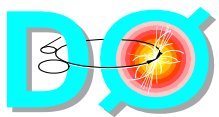
Week of July 15 to July 22 D0 Operations

- Luminosity detector
 - ◆ Stable
- Silicon detector
 - ◆ Power supplies are running well
 - ◆ Quite time used for calibrations
- Calorimeter
 - ◆ Noisy trigger towers and cells masking
 - ◆ Calibration of Level 1 trigger energy scale
- Muon
 - ◆ loss of serial link communication every ~10minutes
 - ▲ limiting Level 3 data transfer rate
 - ▲ related to running in multibuffer mode
 - ▲ experts are working - more diagnostic tools are needed
- Forward proton detector
 - ◆ inserting pots during most stores
 - ◆ request for tunnel access to
 - ▲ fix failures
 - ▲ connect new electronics/hardware



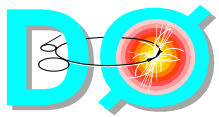
DØ Trigger

- Trigger framework
 - ◆ Existing prescaler logic could report mis-measured luminosity for prescaled triggers
 - ▲ Plan on how to resolve this problem is developed
- L1 trigger
 - ◆ Fiber tracker (CTT) trigger
 - ▲ Implementation for muon triggering is delayed due to higher than specified trigger decision time
 - Different options of resolving this issue are discussed by experts
 - Estimated delay is ~6weeks
 - ◆ Calorimeter trigger
 - ▲ Debug recently achieved eta coverage up to 2.4
 - Dead and noisy towers, calibration
 - ▲ Missing E_t
 - ▲ Extend eta coverage
 - ◆ Muon trigger
 - ▲ Optimize new trigger terms based on scintillator and wire detectors
 - ▲ Re-establish data vs trigger simulator comparison
 - ▲ Attempt to shave 132ns from FPGA logic
 - To accommodate CTT trigger delay



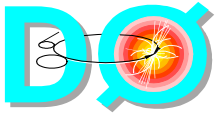
DØ Trigger

- Level 2 trigger
 - ◆ Increase processing bandwidth from current ~0.5kHz
 - ▲ Code speedup/max_opt: 1-2 kHz
 - ▲ Multiple Alphas/Betas in crate >2 kHz?
 - ◆ Silicon track trigger
 - ▲ In progress of installation
 - ▲ Expect beam commissioning later this year (fiber tracker trigger needed)
 - ◆ Fiber tracker
 - ▲ Waiting for inputs - expected in September
 - ◆ Calorimeter trigger
 - ▲ Running on-line ($|\eta| < 0.8$ for now)
 - ▲ Requires better understanding of efficiency, cuts, rejection
 - ◆ Muon trigger
 - ▲ Well developed: single muon, di-muon
 - ▲ Resolving problems with synchronization of signals coming from hundreds of front-ends
 - Detailed monitoring of the inputs is needed
 - ▲ Algorithms optimization (geometry for P_t cut, etc.) is in progress



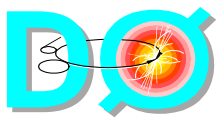
DØ Trigger

- Level 3 trigger
 - ◆ Running on-line for quite a while
 - ◆ Development of fast and efficient algorithms with good rejection is driving the schedule
 - ▲ Tracking Level 3 is coming on-line this week
 - Improve electron and muon rejection
 - Vertex for missing E_t resolution improvement
 - ▲ Calorimeter is one of the most advanced systems
 - Efficiently filtering jets and em objects
 - Coming in p12: missing E_t , non-linearity corrections, hot cell killer
 - ▲ Muon
 - Filtering on limited sub-set of muon triggers
 - Technical issues with muon geometry, efficiency to be better understood
 - ◆ Level 3 trigger basic philosophy
 - ▲ Develop as much as possible inclusive single e, mu, tau, jet filters
 - ▲ Combine tools into di-muon, muon+jet, etc. filters



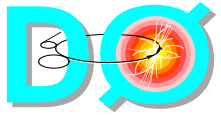
DAQ

- Currently could utilize new DAQ system rate capabilities in a limited way due to complex system of distributed readout and front-end crates
 - ◆ Multi-buffering operation in tracking crates just arrived
 - ▲ Correct “tick and turn” operation to be verified
 - ◆ With estimated DAQ rate capability in the range of ~1kHz we are currently limited to ~140Hz for reliable on-line operation
 - ▲ Current most serious problem is loss of synhronization in muon scintillator crates
 - Every ~10 minutes at 140Hz
 - ▲ There are other concerns on the horizon
 - Tracking crates front-end busy fraction at 140Hz is ~4%
- DAQ rate “task force” has been organized (chaired by Ron Lipton)
 - ◆ Very well defined goal
 - ▲ Bring experts from different sub-systems together to resolve problems preventing us from running at full DAQ capabilities



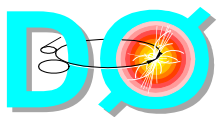
On-line System and Controls

- Key system for data handling/transfer and on-line data quality monitoring
 - ◆ Run II design rate of writing data to tapes at 50Hz has been achieved
- Operations
 - ◆ Significant Event System (alarms)
 - ▲ important issue for high quality data collection
 - ▲ active participation from detector/trigger groups is required
 - ◆ improve support of Examines
- Applications
 - ◆ deploy run configuration/quality database
 - ◆ introduce global DAQ monitor application



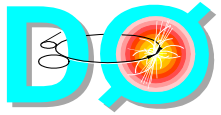
D0 Operating Efficiency

- Goals
 - ♦ From Run I experience
 - ▲ $\sim 190\text{pb}^{-1}$ delivered $\sim 120\text{pb}^{-1}$ recorded ($\sim 60\%$, Main ring vetoes, etc.)
 - ▲ Should do better in Run II $\rightarrow 90\%$
- Moving target
 - ♦ Major reasons of luminosity loss are changing as more systems come on-line
 - ▲ What was a concern a few months/weeks ago is replaced by new “enemies”
 - ▲ Steady increase in operating efficiency during February/March – “steady state” operation
- Recent numbers
 - ♦ $\sim 60\%$ for the last ~ 2 months (lower before)
 - ♦ $\sim 75\%$ last week (after implementation of mutli-buffer readout)



D0 Operating Efficiency

- Major components of the inefficiency
 - ◆ Dead time
 - ▲ Sub-system is setting busy signal due to low bandwidth: L1, L2, L3, DAQ
 - ▲ Adjustable and can be set at almost any value by adjusting trigger rates
 - ▲ Due to lack of multi-buffering in tracking crates had to accept relatively large L1 front-end-busy fraction (~20%) to collect decent data sample before June shutdown
 - ▲ Currently running at about 4% front-end-busy fraction (140Hz readout rate)
 - ◆ Downtime
 - ▲ Data collection is stopped (or could not be started) due to failure of a specific component (or components)
 - ▲ Currently issues are
 - Muon scintillator front-end crates errors
 - High Voltage trips
 - Redownloading of "problematic" crates
 - Begin/end runs
 - Operator errors
 - ▲ Commissioning activities (prescales selection, trigger studies,...)
- Experts are working on resolving all of the above issues
 - ◆ Plan to keep efficiency at the ~70% level while new sub-systems are introduced
 - ◆ Our steady state operating efficiency should be in the range of ~90%
 - ▲ Reachable - D0 had ~85% operating efficiency during some of the recent stores



Summary

- DØ is progressing well with collecting data and finishing commissioning of trigger and readout systems
- No serious short term problems with detector, trigger, DAQ
- DØ will be showing at ICHEP02 for the first time physics results using Run II data
 - ◆ W and Z production cross sections and ratio at 2TeV
 - ◆ b lifetime
 - ◆ several limits for new phenomena searches
- A summary of the most recent results from DØ will be presented at a W&C seminar on Friday, July 26